

CLAIMS

1. A maintenance equipment system suitable for the precision maintenance of turf on a golf course, said system comprising:
 - a. a utility tractor having a plurality of wheels distributed at a front end and a rear end of said tractor,
 - b. a turf maintenance device hitched to said tractor at a location on said tractor sufficient to distribute weight of said maintenance device between said wheels and prevent damage to turf on said course,
 - c. a position location system that displays local position of said utility tractor relative to a treatment area and displays said location to an operator of said tractor, and
 - d. a maintenance control computer system that is in communication with said location system wherein said computer application control system (i) records position information in said target treatment area, (ii) correlates said position information with stored data that identifies the turf treatment needs at said location for said maintenance device, and (iii) sends control signals to said maintenance device for controlling operation of said maintenance device at said location.
2. A system according to claim 1 wherein said utility tractor comprises a hitch for said maintenance device that is located behind an operator cab and at a location above and between front and rear wheels on said tractor.
3. A system according to claim 1 wherein the wheels of said tractor have a width sufficient to prevent damage to turf on a golf course.
4. A system according to claim 1 wherein said maintenance device further comprises an identification node that is provides the maintenance control computer with information about said maintenance device.

5. A computer system according to claim 1 wherein maintenance device is selected from the group consisting of a granular chemical spreader, a liquid chemical sprayer, a mower, and a turf aerator.
6. A system for precision treatment of turf grass areas comprises:
 - a. a utility tractor having a plurality of wheels distributed at a front end and a rear end of said tractor of a width sufficient to prevent damage to turf grass.
 - b. a variable rate spreader hitchable to said tractor and comprising: (i) a storage bin having a discharge opening, and (ii) a movable transport belt that can be moved by a variable speed motor, wherein said transport belt is disposed below said discharge opening for transporting turf treatment agents discharged from said bin for dispersion onto a turf grass area,
 - c. a position location and display system that displays a local position of said utility tractor relative to a treatment area, and
 - d. a computer application control system that is in communication with said location and display system wherein said computer application control system (i) records position information in said target treatment area, (ii) correlates said position information with stored data that identifies the turf treatment needs at said location, and (iii) sends control signals to said discharge opening and/or said variable speed motor for varying the rate of turf treatment agent applied at said location.
7. A system according to claim 6 wherein said spreader is hitched to said tractor at a location sufficient to distribute weight from said spreader among the wheels of said tractor.
8. A system according to claim 7 wherein said tractor further comprises an operator cab and a rear bed, wherein said spreader is hitched to said tractor with a hitch coupling located in said bed.
9. A system according to claim 8 wherein said hitch coupling is located in said bed at a point above and between the front end wheels and the rear end wheels of said tractor.

10. A system according to claim 7 wherein each of the utility tractor wheels has a width sufficiently wide to provide a sufficiently high “footprint” at recommended inflation and maximum load to minimize or avoid damage to turf grass underneath the tire while said tractor is used to pull a loaded spreader.
11. A system according to claim 10 wherein each of the utility tractor wheels has a width within the range from about 8-14 inches.
12. A system according to claim 10 wherein each of the utility tractor wheels has a sidewall height within the range from about 4-8 inches.
13. A system according to claim 10 wherein each of the utility tractor wheels has an aspect ratio within the range from about 0.35 to about 1.
14. A system according to claim 13 wherein each of the utility tractor wheels has an aspect ratio within the range from about 0.4 to about 0.75.
15. A method for treating areas of grass found on a golf course, said method comprising:
applying at least one turf treatment agent in a target location at a rate and over an area corresponding to stored computer information that identifies the course attributes at said target location, wherein application of said turf treatment agent in said area is controlled by a computer system responding to location information that controls the quantity of the applied turf treatment agent thru a spreader controllably linked to said computer and based on (a) location information and (b) a map of course attributes that is stored within said computer.
16. A method according to claim 15 wherein said at least one turf treatment agent is applied using the system of claim 6.
17. A method according to claim 16 wherein said at least one turf treatment agent is applied using an application and spreading system comprising:
 - a. a utility tractor having a plurality of wheels distributed at a front end and a rear end of said tractor, wherein each of the utility tractor wheels has a width

- sufficiently wide to provide a sufficiently high “footprint” at recommended inflation and maximum load to minimize or avoid damage to turf grass underneath the tire while said tractor is used to pull a loaded spreader,
- b. a variable rate spreader towed behind said tractor and comprising a storage bin having a gravity fed discharge opening, a transport apron moved by a variable rate motor and located below said discharge opening for transporting turf treatment agents discharged from said bin to a rotary spreader,
 - c. a position location and display system that displays local position relative to a target treatment area to an operator driving said utility tractor,
 - d. a computer application control system that is in communication with said location and display system wherein said computer application control system (i) records position information in said target treatment area, (ii) correlates said position information with stored data that identifies course attributes at said location, and (iii) sends control signals to said discharge opening and/or said variable rate motor for varying the amount of turf treatment agent applied at said location.
18. A method according to claim 17 wherein said stored data comprises course boundaries, soil sample information, obstacle information, aerial photos, topographic maps, grass species data, moisture, shade, turf health, pest infestation, various types of historical treatment data pertinent to the management of a golf course, or other data relevant for the growing of grass and the various grass species found on a particular course.
19. A method according to claim 17 wherein said stored data comprises course boundaries, soil sample information, grass species data, turf health, pest infestation, and historical treatment data pertinent to the management of a golf course.
20. A method according to claim 17 wherein each of the utility tractor wheels has a width within the range from about 8-14 inches.

21. A system according to claim 20 wherein each of the utility tractor wheels has a sidewall height within the range from about 4-8 inches.
22. A system according to claim 17 wherein each of the utility tractor wheels has an aspect ratio within the range from about 0.35 to about 1.
23. A system according to claim 22 wherein each of the utility tractor wheels has an aspect ratio within the range from about 0.4 to about 0.75.